WHAT IS CLAIMED IS:

1.   A work assignment system for assigning and composing a work formed from a plurality of work standards to a plurality of stations, comprising:

5   display means for displaying names of the plurality of work standards as composition targets;

condition input means for inputting a composition condition;

assignment means for dividing the plurality of

10   work standards in accordance with the composition condition and assigning one group of the divided work standards to a station; and

output means for outputting an assignment result of the work standards of each station to a work

15   assignment file as a composition plan.

2.   The system according to claim 1, wherein said output means displays the names of the work standards assigned to each station in units of stations.

3.   The system according to claim 1, wherein the

20   composition condition is an average value of manhours necessary to execute all the work standards in the station.

4.   The system according to claim 1, wherein

each of the plurality of work standards as the

25   composition targets has manhour value data, and

said system further comprises

calculation means for calculating a total manhour of the plurality of work standards, and

means for entering a value of the total manhour calculated by said calculation means as partial data of

5   the composition condition.

5.   The system according to claim 1, wherein said condition input means displays, on said display means, at least a user interface for inputting numerical values of items including the number of units to be produced in

10   one day, an operation time of a production workshop, and a target composition efficiency as the composition conditions.

6.   The system according to claim 1, further comprising:

15   means for displaying an arbitrary work standard group, and

user interface means for selecting the plurality of work standards as the composition targets from the displayed work standard group.

20   7.   The system according to claim 6, wherein the arbitrary work standard group is classified into one of a component group formed from a plurality of work standards, a model group formed from a plurality of components, a representative model group formed from a

25   plurality of models, and a genre group formed from a plurality of representative models.

8.   The system according to claim 1, wherein said assignment means comprises user interface means for attaching information representing parallel operation of works to the plurality of work standards as the composition targets, and makes a plurality of composition plans in consideration of the attached parallel operation and sends the composition plans to said output means.

9.   The system according to claim 1, wherein said output means visually displays and outputs the total manhour of the work standards of each station.

10.   The system according to claim 1, wherein said output means displays the total manhour of the work standards of each station in a form of a bar graph.

11.   The system according to claim 1, wherein

a window of said display means is divided into a first display area and a second display area, and

said output means displays the bar graph of the total manhour of the work standards of each station in the first display area and the work standards belonging to the station in the second display area in units of stations, the stations in the first display area and those in the second display area being correspondingly displayed.

12.   The system according to claim 1, wherein said output means correspondingly displays the bar graph of

the total manhour of the work standards of each station
and the work standards belonging to the station.

13.   The system according to claim 1, wherein the
composition result is displayed as the bar graph of the
total manhour in units of stations.

14.   The system according to claim 1, wherein the
composition result is displayed as a list of work
standards put together in units of stations and
belonging to each station.

15.   The system according to claim 1, further
comprising:

user interface means for providing a user
interface for further correcting the composition result
output by said output means in units of stations, and

means for receiving editing information input by
said user interface means and correcting the composition
result.

16.   The system according to claim 1, wherein
correction of a station is executed by deleting the
station, adding an arbitrary station to the station,
exchanging an arbitrary work standard in the station
with an arbitrary work standard in another station,
adding an arbitrary work standard to an arbitrary work
standard in the station, or dividing a work standard
belonging to the station into two stations.

17.   The system according to claim 10, wherein

correction of a station is executed by deleting

the station, adding an arbitrary station to the station,

exchanging an arbitrary work standard in the station

with an arbitrary work standard in another station,

5   adding an arbitrary work standard to an arbitrary work

standard in the station, or dividing a work standard

belonging to the station into two stations, and

correcting a length of a bar graph of the station

related to the correction in accordance with a

10   correction result.

18.   The system according to claim 1, wherein a user

interface window for authenticating a user who does

composition is displayed.

19.   The system according to claim 17, wherein a

15   station to be added includes a check work standard.

20.   The system according to claim 3, wherein

said output means displays a total manhour of the

work standards of each station in a form of a bar graph

in units of stations, and

20   for a bar graph of a station including a work

standard having a manhour larger than the average

manhour value, a width of the bar graph is increased to

limit a height of the bar graph.

21.   The system according to claim 1, wherein

25   said system further comprises a database

containing information related to a skill or experience

of an operator, and

said output means extracts the information related to the skill or experience of operators assigned in units of stations and displays the information together on a display window of said display means.

22. A distributed client/server database system comprising:

a server including the work assignment file of claim 1; and

a plurality of clients each having said display means, said condition input means, and said assignment means of claim 1.

23. A work assignment method of assigning and composing a work formed from a plurality of work standards to a plurality of stations, comprising:

a display step of displaying names of the plurality of work standards as composition targets;

a condition input step of inputting a composition condition;

an assignment step of dividing the plurality of work standards in accordance with the composition condition and assigning one group of the divided work standards to a station; and

an output step of outputting an assignment result of the work standards of each station to a work assignment file as a composition plan.

24. The method according to claim 23, wherein, in said output step, the names of the work standards assigned to each station in units of stations are displayed.

25. The method according to claim 23, wherein the composition condition is an average value of manhours necessary to execute all the work standards in the station.

26. The method according to claim 23, wherein

each of the plurality of work standards as the composition targets has manhour value data, and

said method further comprises

a calculation step of calculating a total manhour of the plurality of work standards, and

a step of entering a value of the total manhour calculated in said calculation step as partial data of the composition condition.

27. The method according to claim 23, wherein, in said condition input step, at least a user interface for inputting numerical values of items including the number of units to be produced in one day, an operation time of a production workshop, and a target composition efficiency as the composition conditions are displayed.

28. The method according to claim 23, further comprising:

a step of displaying an arbitrary work standard group, and

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a user interface step of selecting the plurality
of work standards as the composition targets from the
displayed work standard group.

29. The method according to claim 28, wherein the
arbitrary work standard group is classified into one of
a component group formed from a plurality of work
standards, a model group formed from a plurality of
components, a representative model group formed from a
plurality of models, and a genre group formed from a
plurality of representative models.

30. The method according to claim 23, wherein, in said
assignment step, a plurality of composition plans are
generated, by using a user interface attaching
information representing parallel operation of works to
the plurality of work standards as the composition
targets, in consideration of the attached parallel
operation and the generated composition plans are sent
to said output step.

31. The method according to claim 23, wherein, in said
output step, the total manhour of the work standards of
each station is visually displayed and outputted.

32. The method according to claim 23, wherein, in said
output step, the total manhour of the work standards of
each station in a form of a bar graph is displayed.

33. The method according to claim 23, wherein
a window of said display step is divided into a

first display area and a second display area, and

in said output step, the bar graph of the total manhour of the work standards of each station is displayed in the first display area and the work standards belonging to the station is displayed in the second display area in units of stations, in which the stations in the first display area and those in the second display area being correspondingly displayed.

34.   The method according to claim 23, wherein, in said output step, the bar graph of the total manhour of the work standards of each station and the work standards belonging to the station are correspondingly displayed.

35.   The method according to claim 23, wherein the composition result is displayed as the bar graph of the total manhour in units of stations.

36.   The method according to claim 23, wherein the composition result is displayed as a list of work standards put together in units of stations and belonging to each station.

37.   The method according to claim 23, further comprising:

a user interface step of providing a user interface for further correcting the composition result output in said output step in units of stations, and

a step of receiving editing information input in the user interface step and correcting the composition

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result.

38.   The method according to claim 23, wherein, in said correction step, deleting the station, adding an arbitrary station to the station, exchanging an arbitrary work standard in the station with an arbitrary work standard in another station, adding an arbitrary work standard to an arbitrary work standard in the station, or dividing a work standard belonging to the station into two stations is performed as correction operation of the station.

39.   The method according to claim 32, wherein, in said correction step, deleting the station, adding an arbitrary station to the station, exchanging an arbitrary work standard in the station with an arbitrary work standard in another station, adding an arbitrary work standard to an arbitrary work standard in the station, or dividing a work standard belonging to the station into two stations is performed as correction operation of the station, and a displayed length of a bar graph of the station related to the correction is modified in accordance with the correction operation.

40.   The method according to claim 23, further comprising a step of displaying a user interface window for authenticating a user who does composition.

41.   The method according to claim 39, wherein a station to be added includes a check work standard.

42.   The method according to claim 25, wherein, in said

output step, a total manhour of the work standards of

each station in a form of a bar graph in units of

stations is displayed, and a height of the bar graph of

5   a station including a work standard having a manhour

larger than the average manhour value is limited by

increasing a width of the bar graph.

43.   The method according to claim 23, wherein, in said

output step, information related to the skill or

10   experience of operators assigned in units of stations is

obtained from a database containing information related

to a skill or experience of an operator and the obtained

information is displayed together on a display window of

a display screen.

15   44.   A computer program storage medium storing program

codes of said work assignment method to realize said

work assignment method of claim 23 by a computer system.

45.   The system according to claim 8, wherein

said assignment means comprises code attachment

20   means for causing a user to attach a single group code

to a plurality of works in order to assign the plurality

of works to a single station, and

said output means assigns work standards having

the same group code to a station corresponding to the

25   group code.

46.   The system according to claim 1, wherein

said user interface means has a display unit for displaying a chart showing a priority order relationship representing continuous and parallel operations of works, and

5   said code attachment means displays works having the same group code on said display unit so as to discriminate the works from works having another group code and works having no group code.

47.   The system according to claim 45, wherein

10   each work standard as an assignment target has data representing continuous and parallel operations of works, and

said assignment means comprises

means for detecting that the user executes, for an

15 arbitrary work standard, group designation to alter the continuous and parallel operations through said code attachment means, and

means for, when the detection is done, outputting a warning message or inhibiting the group designation.

20 48.   The system according to claim 47, wherein said detection means determines that the continuos and parallel operations are altered upon detecting that the user designates first and second groups so as to insert a work which should belong to the first group between

25 two works belonging to the second group.

49.   The system according to claim 1, wherein

said system further comprises simulation means for executing simulation of a production operation in the plurality of stations on the basis of the composition plan acquired from said assignment means, said

5   simulation means being capable of transferring output data representing a condition and execution result of the simulation to said assignment means, and

said assignment means comprises averaging means for hanging assignment of each station on the basis of

10   the output data acquired from said simulation means and data representing performance of each of the plurality of stations so as to satisfy the predetermined condition, thereby making a new composition plan in which unbalance in works between the stations is

15   eliminated.

50.   The system according to claim 49, wherein said simulation means comprises a user interface capable of setting a defective inclusion ratio of a part or material actually used for production of units in the

20   plurality of stations, an operation error ratio of each station, yield of units and variation range of the yield related to the defective inclusion ratio and operation error ratio and setting a value representing performance of each of the plurality of stations, and outputs a

25   margin for works of each station, stagnation of fabricated products, and a quantity of completed

nondefective products as the execution result of the simulation.

51. The system according to claim 49, wherein said assignment means comprises first conversion means for converting the made composition plan into a format loadable as the manhour of each station for the simulation so as to transfer the composition plan to said simulation means.

52. The system according to claim 51, wherein said first conversion means includes the manhour of each station in data of a file to be output to said simulation means.

53. The system according to claim 49, wherein said simulation means comprises second conversion means for converting the condition of the simulation into a format with which said assignment means can load a condition for composition plan making and the value representing the performance so as to transfer the condition and execution result of the simulation to said assignment means.

54. The system according to claim 53, wherein said simulation means includes a value representing the manhour of each station and a value representing performance of each station in the data of the file to be output to said assignment means.

55. The system according to claim 49, wherein in

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making a new composition plan on the basis of the output data acquired from said simulation means and the value representing the performance of each of the plurality of stations, when a constraint condition for the continuous and/or parallel operation of assembly works as the plurality of work standards is preset by the user, said averaging means makes a composition plan satisfying the constraint condition.

56.   The system according to claim 49, wherein in making a new composition plan on the basis of the output data acquired from said simulation means and the value representing the performance of each of the plurality of stations, when a group of a plurality of types of assembly works in assembly works as the plurality of work standards is preset by the user, said averaging means assigns the plurality of types of assembly works included in the group to a single station.

57.   The system according to claim 49, wherein said assignment means comprises means for changing the number of stations on the basis of a time required for works of each station, which is changed in consideration of the yield of units to be produced in the plurality of stations, and a stop time and average performance of each station.

58.   The system according to claim 49, wherein said assignment means comprises a user interface capable of

setting the number of units to be produced in one day by
one crew as a set of a plurality of operators assigned
to each station and the number of units per day, which
is excluded from a production line by the crew on a

5   display window in which a condition for calculation of
the number of units to be invested into a top station of
the production line formed from the plurality of
stations can be set.

59.   The system according to claim 49, wherein said
10   assignment means displays a display window including a
user interface capable of setting a one-day working time
of one crew as a set of a plurality of operators
assigned to each station of a production line formed
from the plurality of stations and a stop time of the
15   production line.

60.   The system according to claim 49, wherein said
simulation means displays a display window comprising a
user interface capable of setting a one-day working time
of one crew as a set of a plurality of operators
20   assigned to each station of a production line formed
from the plurality of stations and changeably setting a
stop time of the production line in units of days or
time zones by inputting a probability distribution,
average value, and variance value, and displays a
25   one-day operation time of the crew in the display window
in units of predetermined times as a result of setting

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of the set one-day working time and stop time.

61.   The system according to claim 49, wherein said simulation means displays a display window including a user interface capable of setting manhours of works

5   assigned to each of the plurality of stations, a value representing performance of each station, and upper and lower limit values of a variation width of the value in units of time zones and changeably setting the value representing the performance in accordance with time and

10   probability distribution within a range of the set predetermined variation width, calculates a one-day production quantity of one crew as a set of a plurality of operators assigned to each station of a production line formed from the plurality of stations on the basis

15   of the conditions set in the display window, and displays the calculated production quantity in the display window.

62.   The system according to claim 49, wherein said simulation means can set, in a display window including

20   a user interface, a defective inclusion ratio of a part or material actually used for production of units in the plurality of stations, yield of each station in accordance with an operation error ratio, and a station from which a defective product is to be excluded and set

25   the yield determined by the operation error ratio changeably in accordance with probability distribution

in units of time zones, calculates a one-day production
quantity of one crew as a set of a plurality of
operators assigned to each station of a production line
formed from the plurality of stations on the basis of
the conditions set in the display window, and displays
the calculated production quantity in the display
window.

63.   The system according to claim 49, wherein said
simulation means comprises a user interface capable of
setting, in addition to the plurality of stations
included in the composition plan acquired from said
assignment means, an assembly station for performing an
assembly work independently of the stations and/or a
readjustment station for readjusting a defective product
generated in the plurality of stations included in the
composition plan and returning the readjusted defective
product to the plurality of stations again as a
nondefective product.

64.   The system according to claim 63, wherein a
defective item of the defective product generated in the
plurality of stations included in the composition plan,
a station where the defective product is generated, and
the readjustment station for returning the defective
product after readjustment in accordance with the
station where the defective product is generated can be
set in the user interface of said simulation means.

65.   The system according to claim 49, wherein

in addition to the operators in the composition included in the composition plan acquired from said assignment means, a support operator who supports the operators in the composition independently of the composition can be set in the user interface of said simulation means, and

when the support operator is set as an alternate operator, an unaided assembly operator, a management operator, and a readjustment operator, the number of alternate operators to be transferred to a station of the composition can be changeably set in units of days in accordance with the probability distribution by setting the necessary number of support operators to be required and setting an attendance ratio of each operator in the composition by setting the probability distribution, average value, and variance value, and an upper limit value of the number of readjustment operators can be changeably set in units of days by subtracting the number of alternate operators to be transferred to the station from the number of support operators.

66.   The system according to claim 49, wherein said averaging means displays a display window including a user interface capable of setting a value representing performance of each station as a condition for

calculation of a target manhour of the station.

67.   The system according to claim 49, wherein in
making a new composition plan on the basis of the output
data acquired from said simulation means and the value
representing the performance of each of the plurality of
stations, said averaging means exchanges works of the
stations so as to make the manhour of each station close
to a target manhour on the basis of a difference of the
target manhour and a corresponding actual manhour of
each station and the continuous and/or parallel
operation preset for an assembly work as the work
standard.

68.   The system according to claim 67, wherein in
exchanging the works of the stations, when a group of a
plurality of types of assembly works in assembly works
as the plurality of work standards is preset by the
user, said averaging means assigns the plurality of
types of assembly works included in the group to a
single station.

69.   The system according to claim 49, wherein said
assignment means can set and change the number of units
to be excluded from a station during production by one
crew as a set of a plurality of operators assigned to
each station and set and change a stop time of a
production line and an expected composition efficiency
value, and comprises a user interface for calculating a

time and the number of stations required for a work of
each station on the basis of values of set and changed
number of units to be excluded, stop time, and expected
composition efficiency and displaying a calculation
5 result.

70.   The method according to claim 23, wherein
said method further comprises a simulation step of
executing simulation of a production operation in the
plurality of stations on the basis of the composition
10 plan acquired in said assignment step, and
said assignment step includes an averaging step of
changing assignment of each station on the basis of a
condition and execution result of the simulation, which
are acquired in said simulation step, and data
15 representing performance of each of the plurality of
stations so as to satisfy the predetermined condition,
thereby making a new composition plan in which unbalance
in works between the stations is eliminated, said
simulation step and said averaging step being repeatedly
20 executed until a desired simulation execution result is
obtained.

71.   The method according to claim 70, wherein, in said
simulation step, a margin for works of each station,
stagnation of fabricated products, and a quantity of
25 completed nondefective products are outputted, as the
execution result of the simulation, in accordance with

setting a defective inclusion ratio of a part or

material actually used for production of units in the

plurality of stations, an operation error ratio of each

station, yield of units and variation range of the yield

5   related to the defective inclusion ratio, operation

error ratio, and a value representing performance of

each of the plurality of stations.

72.   The method according to claim 70, wherein, in said

averaging step, a composition is planed to satisfy a

10   constraint condition for the continuous and/or parallel

operation of assembly works as the plurality of work

standards, when making a new composition plan on the

basis of the condition and execution result of the

simulation, which are acquired in said simulation step,

15   and the value representing the performance of each of

the plurality of stations.

73.   The method according to claim 70, wherein, in said

averaging step, a plurality of types of assembly works

included in a group of the plurality of types of

20   assembly works in the assembly works as the plurality of

work standards are assigned into a single station, when

making a new composition plan on the basis of the

condition and execution result of the simulation, which

are acquired in said simulation step, and the value

25   representing the performance of each of the plurality of

stations.

74.   The method according to claim 70, wherein, in said assignment step, the assignment of each station is changed in consideration of the yield of units to be produced in the plurality of stations and a stop time and average performance of each station, and the number of stations are changed on the basis of a time required for works of each station.

75.   The method according to claim 70, wherein, in said assignment step, a display window capable of setting a condition for calculation of the number of units to be invested into a top station of a production line formed from the plurality of stations is arranged to have a user interface capable of setting the number of units to be produced in one day by one crew as a set of a plurality of operators assigned to each station and the number of units per day, which is excluded from the production line by the crew.

76.   The method according to claim 70, wherein, in said assignment step, a display window, which includes a user interface capable of setting a one-day working time of one crew as a set of a plurality of operators assigned to each station of a production line formed from the plurality of stations and a stop time of the production line, is displayed.

77.   The method according to claim 70, wherein, in said simulation step, a display window comprising a user

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interface capable of setting a one-day working time of one crew as a set of a plurality of operators assigned to each station of a production line formed from the plurality of stations and changeably setting a stop time

5 of the production line in units of days or time zones by inputting a probability distribution, average value and variance value are displayed, and a one-day operation time of the crew is displayed, as a result of setting the items, in units of predetermined times on the

10 display window.

78.   The method according to claim 70, wherein, in said simulation step,

a display window, which includes a user interface capable of setting manhours of works assigned to each of

15 the plurality of stations, a value representing performance of each station, and upper and lower limit values of a variation width of the value in units of time zones and changeably setting the value representing the performance in accordance with time and probability

20 distribution within a range of the set predetermined variation width is displayed,

a one-day production quantity of one crew as a set of a plurality of operators assigned to each station of a production line formed from the plurality of stations

25 is calculated on the basis of the conditions set in the display window, and

the calculated production quantity is displayed on the display window.

79.   The method according to claim 70, wherein, in said simulation step,

a display window is arranged to include a user interface, a defective inclusion ratio of a part or material actually used for production of units in the plurality of stations, yield of each station in accordance with an operation error ratio, and a station from which a defective product is to be excluded and set the yield determined by the operation error ratio changeably in accordance with probability distribution in units of time zones, and

a one-day production quantity of one crew as a set of a plurality of operators assigned to each station of a production line formed from the plurality of stations is calculated on the basis of the conditions set in the display window, and displaying the calculated production quantity on the display window.

80.   The method according to claim 70, wherein, in said simulation step,

a user interface capable of setting, in addition to the plurality of stations included in the composition plan acquired in said assignment step, an assembly station for performing an assembly work independently of the stations and/or a readjustment station for

readjusting a defective product generated in the

plurality of stations included in the composition plan

and returning the readjusted defective product to the

plurality of stations again as a nondefective product is

5   displayed.

81.   The method according to claim 80, wherein, in said

simulation step, the user interface is designed to be

able to set a defective item of the defective product

generated in the plurality of stations included in the

10   composition plan, a station where the defective product

is generated, and the readjustment station for returning

the defective product after readjustment in accordance

with the station where the defective product is

generated.

15   82.   The method according to claim 70, wherein, in said

simulation step, the user interface is designed to be

able to set, in addition to the operators in the

composition included in the composition plan acquired in

the assignment step, a support operator who supports the

20   operators in the composition independently of the

composition, and when the support operator is set as an

alternate operator, an unaided assembly operator, a

management operator, and a readjustment operator,

changeably set the number of alternate operators to be

25   transferred to a station of the composition in units of

days in accordance with the probability distribution by

setting the necessary number of support operators to be
required and setting an attendance ratio of each
operator in the composition by setting the probability
distribution, average value, and variance value, and

5 changeably set an upper limit value of the number of
readjustment operators in units of days by subtracting
the number of alternate operators to be transferred to
the station from the number of support operators.

83. The method according to claim 70, wherein, in said
10 averaging step, a display window including a user
interface capable of setting a value representing
performance of each station as a condition for
calculation of a target manhour of the station is
displayed.

15 84. The method according to claim 70, wherein, in said
averaging step, works of the stations are exchanged so
as to make the manhour of each station close to a target
manhour on the basis of a difference of the target
manhour and a corresponding actual manhour of each
20 station and the continuous and/or parallel operation
preset for an assembly work as the work standard,

when a new composition plan is generated on the
basis of the condition and execution result of the
simulation in the simulation step and the value
25 representing the performance of each of the plurality of
stations.

85. The method according to claim 84, wherein, when exchanging the works of the stations and a group of a plurality of types of assembly works in assembly works as the plurality of work standards is preset by the user, the plurality of types of assembly works are assigned to be included in the group to a single station in said averaging step.

86. The method according to claim 70, wherein said assignment step including steps of:

changing the number of units to be excluded from a station during production by one crew as a set of a plurality of operators assigned to each station,

calculating a time and the number of stations required for a work of each station in accordance with setting and changing a stop time of a production line and an expected composition efficiency value, and

displaying the calculated result.

87. A computer program storage medium storing program codes of said work assignment system to realize said work assignment system of claim 49 by a computer system.

88. The system according to claim 2, wherein the composition condition is an average value of manhours necessary to execute all the work standards in the station.

89. The method according to claim 24, wherein the composition condition is an average value of manhours

necessary to execute all the work standards in the

station.